IN THE CLAIMS

1. (Currently Amended) A method ~~fox~~ for controlling the attitude of a satellite equipped with an attitude control system in a reference coordinate system (X, Y, Z) fixed with respect to the satellite for positioning the satellite, the method comprising:

providing the attitude control system that comprises:

~~no more than~~ only three primary actuators including two control moment gyros and one Z-axis actuator, the two control moment gyros each comprising:

a rotor connected to a steerable gimbal, each rotor having a fixed axis with respect to the steerable gimbal, each gimbal having a fixed axis with respect to the satellite, the fixed axis of each rotor being perpendicular with respect to the fixed axis of its connected gimbal, the gimbal axes being parallel to each other and the Z-axis,

each rotor driven to rotate about its fixed axis to orient its connected steerable gimbal about the fixed axis of said gimbal,

~~a third~~ the Z-axis actuator delivering torque in at least one direction not lying in a (X, Y) plane,

~~wherein~~ the angular momentum vectors (H_1, H_2) of the control moment gyros move in the (X, Y) plane and define between them an angle (α) which is related to a skew angle (ε), wherein $\varepsilon = 180 - \alpha$ between the angular momentum vectors (H_1, H_2) when α is greater than 0° and less than 180°;

wherein the method comprises the following steps:

providing a set of secondary actuators used to achieve the offloading of the primary actuators; the secondary actuator being chosen among magnetic torquers, jet actuators, steerable reflecting ailerons or tabs;

the method comprises an initialization phase during which the secondary actuators are operated in order to generate an angular momentum in at least one direction in

the (X,Y) plane for bringing the pair of control moment gyros into a configuration in which the angle (α) has a value different from 0° and 180°;

the method further comprising the steps of:

using the Z-axis actuator for delivering torques in at least one direction not lying in the (X, Y) plane;

imparting ~~a sufficiently small~~ nonzero skew angle (ε) between the angular momentum vectors (H_1, H_2) of the control moment gyros ~~to avoid an excessively large internal angular momentum on board the satellite, the nonzero skew angle (ε) being large enough to ensure controllability of the attitude control system along the three axes (X, Y, Z) without having to modify the rotation speed of the rotor of at least one of the control moment gyros~~;

estimating kinematic and dynamic variables ~~including attitude angles and angular velocities~~ of the satellite along the X, Y and Z axes from measurements provided by sensors disposed on board the satellite;

calculating setpoint variables for controlling a desired attitude of the satellite with respect to the three axes of the (X, Y, Z) coordinate system; and

calculating control commands from differences between said estimated kinematic and dynamic variables and said setpoint variables, the control commands comprising commands to vary the orientation of the gimbal axes of the control moment gyros~~, to provide gimbal angular position setpoints for local position feedback control, and to provide electric current setpoints for current delivered to rotors used for orienting the gimbal axes of the control moment gyros,~~

~~wherein the control commands that are intended to vary the orientation of the gimbal axes of the control moment gyros and limit a range of variations of the angle (α) within a specified angular range greater than 0° and less than180°~~;

sending the calculated control commands to the three primary actuators;

sending commands to the secondary actuators to modify the angle (α) between the angular momentum vectors (H1 and H2) of the control moment gyros so that said angle (α) remains within a specified range that includes neither 180° nor 0°.

2. (Cancelled).

3. (Cancelled).

4. (Currently amended) The attitude control method as claimed in claim ~~2~~ ~~further comprising:~~

~~modifying the angle (α) between the angular momentum vectors (H_1 and H_2) of the control moment gyros so that said angle (α) remains within a specified range and,~~

~~desaturating the Z-axis actuator, and~~

1, wherein the Z-axis actuator comprises one reaction wheel.

5. (Currently Amended) The control method as claimed in claim 1, ~~characterized in that~~ wherein a total angular momentum of the two control moment gyros, resulting from the skew (ε) angle between the angular momentum vectors (H_1, H_2) of said control moment gyros, is oriented in a direction normal to the orbital plane of the satellite.

6. (Currently Amended) The control method as claimed in claim 1, ~~characterized in that~~ wherein a total angular momentum of the two control moment gyros, resulting from the skew (ε) angle between the angular momentum vectors (H_1, H_2) of the two control moment gyros, is compensated for by the projection in the (X,Y) plane of the cumulative specific moment by the Z-axis actuator.

7. (Previously Presented) The control method as claimed in claim 1 further comprising:

establishing a setpoint configuration for the two control moment gyros from initial and final conditions of the satellite so that an angular momentum exchange between the satellite and the two control moment gyros is brought into said setpoint configuration and

generating a desired attitude maneuver with the Z-axis actuator, the Z-axis actuator comprising a reaction wheel; and

rotating the rotors using an open-loop servocontrol to orient each gimbal within the setpoint configuration; and

generating a Z-axis angular momentum profile by varying a speed of the reaction wheel.

8. (Previously Presented) The control method as claimed in claim 7, further comprising:

adding closed-loop commands to the open-loop servocontrol.

9. (Cancelled).

10. (Previously Presented) The attitude control method as claimed in claim 3, further comprising:

using the at least one secondary actuator to generate torques along one or more of the X, Y or Z, axes of the reference coordinate system, and

desaturating the Z-axis actuator.

11. (New) The control method of claim 1, wherein the kinematic and dynamic variables comprise attitude angles and angular velocities of the satellite.

12. (New) The control method as claimed in claim 1, wherein the commands to vary the orientation of the gimbal axes of the control moment gyros comprise gimbal angular position setpoints that have been generated by a local feedback control in position or electric current setpoints, for currents that have been injected into motors for orientating the gimbal axes.